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NOTE ON SCHULENBURG'S SOLUTION OF THE GENERAL EQUATION OF THE FIFTH DEGREE.

BY W. E. HEAL, WHEELING, INDIANA.

SCHULENBURG makes the solution of the quintic

$$x^5 + p_2x^3 - p_3x^2 + p_4x - p_5 = 0,$$

depend upon that of the sextic

$$y^6 - \frac{1}{4}q_2y^4 + \frac{1}{16}q_4y^2 - q_5y + \frac{1}{64}q_6 = 0.$$

(See ANALYST, Vol. IV, page 50, Eq. V.)

If from (1) and (4) of Eq. VIII (Vol. IV, pp. 51 and 52) we eliminate $\frac{1}{3}(a-20d)$, we find

“IX. (1) Function $a\beta\gamma\delta = 0$; thus

(2) Function $A. B. C. D = N$ having been formed, N must $= 0$.”

I use the letters q_2, q_4, q_6, q_5 instead of A, B, C, D and I write “IX. (2)” thus;

$$F(q_2, q_4, q_6, q_5) = N.$$

If we write (1) and (4) of Eq. “VIII” in the form

$$a_1m^4 + b_1m^3 + c_1m^2 + d_1m + e_1 = 0,$$

$$a_2m^4 + b_2m^3 + c_2m^2 + d_2m + e_2 = 0,$$

and determine the eliminant $F(p_2, p_4, p_6, p_5)$, (see Salmon's Algebra, p. 396), it is readily seen that the term $a_1^4e_2^4$ does not vanish and therefore $F(p_2, p_4, p_6, p_5)$ cannot $= 0$. Or, in other words, the equation $N = 0$, which is assumed to be true by Schulenburg, is *not* true.

NOTE BY PROF. HYDE.—In my solution of Prob. 283, in the ANALYST for Jan. 1880, by inadvertence, a V was omitted from all the equations after the first which makes the results untrue. It should have been

$$Va\rho + V\beta\rho \quad V(a+\beta)\rho,$$

which contains the proof, since

$$UVa\rho = UV\beta\rho = UV(a+\beta)\rho,$$

(because a, β and ρ are coplanar), and therefore

$$TVa\rho + TV\beta\rho = TV(a+\beta)\rho,$$

when P is outside the parallelogram; and

$$UVa\rho = -UV\beta\rho = \pm UV(a+\beta)\rho, \text{ and}$$

$$\therefore TVa\rho - TV\beta\rho = \pm TV(a+\beta)\rho,$$

when P is inside. These tensors are the product required.